Health & Place 22 (2013) 29–37

Contents lists available at SciVerse ScienceDirect

Health & Place

journal homepage: www.elsevier.com/locate/healthplace

Review Essay

Co-variation in dimensions of smoking behaviour: A multivariate analysis of individuals and communities in Canada

Daniel J. Corsi [a,*], S.V. Subramanian [b], Scott A. Lear [c], Clara K. Chow [d], Koon K. Teo [e], Michael H. Boyle [f]

[a] Harvard Center for Population and Development Studies, Harvard University, 9 Bow Street, Cambridge, Massachusetts, 02138, USA
[b] Department of Social and Behavioral Sciences, Harvard School of Public Health, Boston, Massachusetts, USA
[c] Faculty of Health Sciences, Simon Fraser University, Vancouver, British Columbia, Canada
[d] The George Institute for Global Health, University of Sydney, New South Wales, Australia
[e] Population Health Research Institute, McMaster University and Hamilton Health Sciences, Hamilton, Ontario, Canada
[f] Department of Psychiatry and Behavioural Neurosciences & Offord Centre for Child Studies, McMaster University and Hamilton Health Sciences, Hamilton, Ontario, Canada

ARTICLE INFO

Article history:
Received 19 September 2012
Received in revised form
1 February 2013
Accepted 3 March 2013
Available online 13 March 2013

Keywords:
Tobacco
Smoking/prevention & control
Health behaviour
Geographic variation
Social environment
Canada

ABSTRACT

We evaluated the effects of socioeconomic status on the prevalence of current smoking, number of cigarettes smoked per day and pack-years, and the extent to which prevalence and consumption co-vary across communities, health regions, and provinces in Canada between 2001 and 2010. Current smoking, cigarettes per day, and pack-years were considered as outcomes within individuals using a multilevel analytical framework. Markers of SES were education, income, and occupation. Residual covariance estimated at the different levels of geography was used to determine if areas high in current smoking were also high on levels of consumption. A strong inverse gradient was found between education and current smoking and level of consumption with large variation found in levels of consumption between individual smokers. The co-variation between current smoking and level of consumption was positive and statistically significant at the level of communities and health regions. Our findings suggest that novel policy efforts may be needed to encourage smoking prevention/cessation among certain population groups and in places with high levels of smoking prevalence and tobacco use intensity.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Daily smoking of even a few cigarettes has been associated with an increased risk of all-cause mortality, mortality from ischaemic heart disease, and lung cancer (Bjartveit and Tverdal, 2005). In addition, a linear/log linear dose-effect relationship has been described between smoking and the risk of MI, chronic obstructive pulmonary disease (COPD), chronic bronchitis (CB), emphysema (Forey et al., 2011), and lung cancer (Alberg et al., 2007; Forey et al., 2011; Yusuf et al., 2004). For example, in a large international case-control study, the number of cigarettes smoked daily was found to be directly associated with risk of MI (Teo et al., 2006), while a similar dose-effect relationship has been observed between cumulative cigarette smoking and lung function (Dockery et al., 1988). Therefore, although smoking in even small quantities is harmful, if the dose-effect relationship between smoking and disease is assumed to be linear or log-linear, a proportional reduction in the amount or intensity of smoking among individuals (either through cessation, increased periods of abstinence during quit attempts, or non-daily smoking) could translate into large reductions in risk (e.g. of MI) within populations (Hassmiller et al., 2003; Rose, 1992).

At the population level, strategies to reduce cumulative exposure to smoking through prevention and increasing quit rates at younger ages (thus reducing lifetime duration of smoking) have the potential for significant reduction in smoking-attributable morbidity and mortality (Peto et al., 2006). In addition, place has been shown to be an important influence on aspects of smoking behaviour in Canada (Corsi et al., 2012); identifying areas with particularly high rates of smoking and/or levels of consumption will be important for targeting tobacco control initiatives and cancer screening programs (Aberle et al., 2011).

In this paper, we provide two important methodological and substantive advances over previous research. First, we examine the extent to which smoking prevalence and level of tobacco consumption co-vary across provinces, health regions, and communities in Canada, providing detail on the role of place in shaping the codetermination of smoking rates and levels of consumption at the macro-, meso-, and mico-levels of geography in Canada. Second, although low socioeconomic status (SES) has been implicated as important determinant

* Corresponding author. Tel.: +1 617 496 8342; fax: +1 617 495 5418.
E-mail address: djcorsi@hsph.harvard.edu (D.J. Corsi).

1353-8292/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.healthplace.2013.03.001

of current smoking (Laaksonen et al., 2005; Schaap et al., 2008; Smith et al., 2009), few studies have considered how SES markers may be related to current smoking and amount of consumption in the same analysis (Chaix et al., 2004; Duncan et al., 1996); and, at the same time, no study has modelled cumulative lifetime tobacco exposure as an endpoint.

Both approaches are conceptualised using a multilevel analytical framework (Duncan et al., 1996; Subramanian et al., 2003). The multilevel framework is used in this context to simultaneously evaluate the effects of demographic and socioeconomic characteristics on the prevalence of current smoking, consumption levels (number of cigarettes smoked per day), and cumulative smoking exposure (pack-year history) by treating current smoking and measures of consumption as distinct yet interrelated outcomes within individuals.

2. Methods

2.1. Data sources

We use two national datasets with detailed place-related measures: the Canadian Tobacco Use Monitoring Survey (CTUMS) and the Canadian Community Health Survey (CCHS). Both surveys were developed and conducted by Statistics Canada (Statistics Canada, 2010a, 2012), and have been previously described (Corsi, 2012). In brief, CTUMS is designed to provide Health Canada with continuous data on the prevalence of smoking in Canada and the provinces; it has been conducted annually since 1999 and over-samples 15–24 year olds, who are at elevated risk for taking up smoking (Health Canada, 2011b). The CCHS is a large nationally-representative survey which collects health-related data at sub-provincial levels of geography in Canada. We analysed data from the 2010 CTUMS, conducted between February and December 2010 (Statistics Canada, 2011), and from four cross-sectional cycles of the CCHS conducted in 2001, 2003, 2005, and 2007/2008. (Desmeules, 2004). The four CCHS cycles incorporated identical questions on smoking history and were combined to form a pooled sample for analysis (Thomas and Wannell, 2009). These cycles of the CCHS dataset were pooled to increase the community sample size to sufficiently model the co-variation in current smoking and amount at this level. All CCHS models included a fixed effect for survey year to control for time trends. Further details of the survey design for the CCHS and CTUMS are given in the Supplementary Appendix.

2.2. Description of geographic areas

In Canada there are 10 provinces and 3 territories at the highest level of geography. Both the CTUMS and CCHS provide details on province of residence of respondents and all analyses take into account this geographic unit representing the larger macro-contextual level. In the CTUMS, however, province was the only geographic identifier provided and analyses of this dataset were restricted to individuals nested within provinces. In order to make use of other geographic units at the meso- and micro-levels which have been shown to be important sources of variability in smoking behaviour in Canada (Corsi et al., 2012), we undertook additional analyses using the CCHS master files, which included geographic identifiers for health regions and communities. Health regions represent the meso-geographic scale within provinces and are used for surveillance and monitoring by provincial health authorities. We have used the 2007 definition of health regions, which correspond with the geographic boundaries of the 2006 Census (Statistics Canada, 2007). Communities, representing the mico-level, were defined based on census dissemination areas (DA). DA are the smallest geographical units for which census data are available; they are composed of between 400 and 700 individuals and cover the entire country (Statistics Canada, 2010b). Although no standard definition of community exists in Canada, the DA is likely to correspond to an individual's perception of his or her community (Corsi, 2012; Corsi et al., 2012).

2.3. Sample for analysis

In total CTUMS collected information from 19,822 respondents aged 15–85 years from the 10 Canadian provinces. All respondents had complete information on current smoking status, age, sex, and province of residence. Respondents with incomplete information for marital status, occupation, or education were excluded ($n=439$, 2.2%); the final sample for analysis was 19,383. The CCHS sample included all adults aged ≥18 ($n=481{,}033$) hierarchically nested in 10 provinces/3 territories, 121 health regions, and 49,088 communities. Among these, 1506 (0.3%) did not have information on smoking status and were excluded. An additional 16,528 (3.4%) individuals had missing data on one or more covariates and were excluded. Missing or invalid residential postal codes limited the assignment of a further 1290 observations (0.2%) to their correct DA and/or health region and these individuals were not included in the analyses. The final analytic sample for the CCHS comprised 461,709 adults.

2.4. Outcome measures

The primary outcome was current cigarette smoking at the time of survey, defined as individuals who had smoked 100 cigarettes in their lifetime (about 5 packs), and reported smoking at least 1 cigarette daily over the 30 days preceding the survey. Further, if individuals did not report having smoked 100 cigarettes, but had been smoking daily for at least 1 year, or had reported smoking at least 100 cigarettes over the previous 30 days, they were considered current smokers. Non-smokers included lifelong never smokers, former smokers at the time of survey, and individuals who smoked less than 1 cigarette per day. Smokers were asked to report detailed smoking histories which captured the age at which they first began smoking and number of cigarettes smoked on each of the seven days leading up to the survey. Secondary outcomes were the usual level of consumption, calculated as the average number of cigarettes smoked daily using the respondent's smoking history of the previous week, and cumulative exposure to tobacco, defined in ‘pack-years’, where one ‘pack-year’ is equivalent to 20 cigarettes smoked per day for one year (Prignot, 1987).

2.5. SES markers

We considered, education, and occupation, and income (in the CCHS only) as the key markers of SES. Education was categorised as less than secondary school, completed secondary school, completed post-secondary/college, or completed university, with the reference group being those who had completed university. Occupation was categorised following the 2006 National Occupational Classification for Statistics (Statistics Canada, 2006a), and included categories for professional specialties (modelled as reference), executive or managerial positions, sales/service positions, and manual occupations (including trades, transport, industry, manufacturing, and utilities). We included categories for individuals not currently working and for respondents who did not report their occupation, and for those working in farming, forestry, or fishing (CCHS only). Income was captured in the CCHS as total household income reported in dollars, and we defined the following categories: <$20,000, $20,000–$40,000, $40,000–$60,000, $60,000–$80,000, $80,000+, and not reported (reference: $80,000+).

Download English Version:

https://daneshyari.com/en/article/7459110

Download Persian Version:

https://daneshyari.com/article/7459110

Daneshyari.com